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S E C R E T

50X1-HUM

COUNTRY Hungary

REPORT

SUBJECT

Magyar Adocsogyar (Hungarian Transmitter Tube Factory).

DATE DISTR. 30 OCT 1957

50X1-HUM

NO. PAGES

1

REQUIREMENT NO.

RD

REFERENCES

DATE OF INFO.

PLACE & DATE ACQ.

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report concerning the Magyar Adocsogyar (Hungarian Transmitter Tube Factory), Budapest. The report gives the following information:

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2. Titles, locations, approximate number of employees, and lists of items produced by the 12 plants controlled by the Department of the Telecommunications Industry of the Hungarian Ministry of Metallurgy and Machine Industry.
3. General information on production and testing of tubes, development of new types, marketing of tubes abroad, and the obtaining of Western-produced tubes in order to imitate them and improve the 50X1-HUM factory's own production.
4. Monthly production plan for tubes, with values in Hungarian forint.
5. Three charts, showing transmitter tube ratings, rectifier ratings and capacitor ratings.
6. An organizational chart showing the structure of the Magyar Adocsogyar, Budapest.

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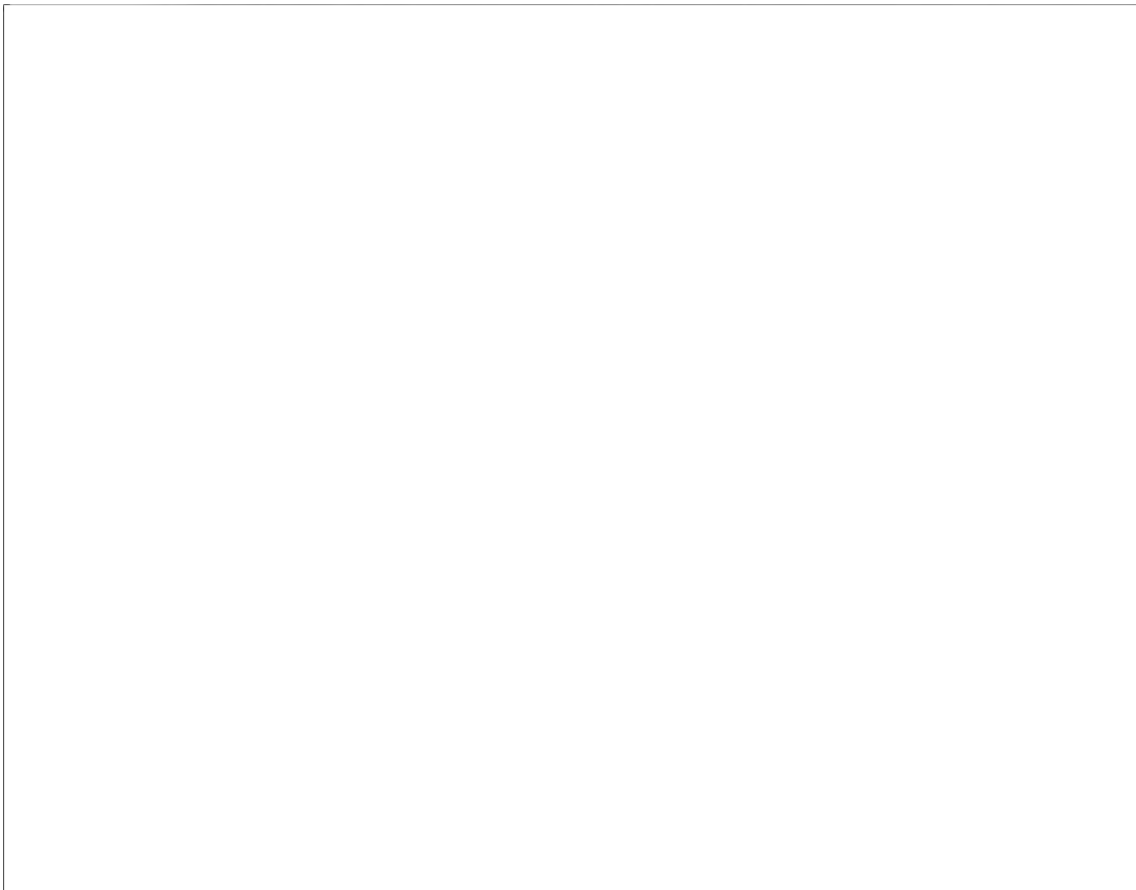
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12th July, 1957.



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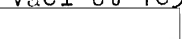
Hungarian Transmitter Valve Factory, BUDAPEST XIII,
Vaci Ut 169



II. Ministry of Machine Construction and Blast Furnaces,
BUDAPEST V, Nador Utc.

5. Each of the various departments into which this Ministry is subdivided is responsible for a group of factories. The Department of the Telecommunications Industry, BUDAPEST V, Arany Janos Utc., controls the following twelve factories which were the most important works in this industry until the October 1956 rising:

- (a) The Hungarian Transmitter Valve Factory, BUDAPEST XIII, 50X1-HUM
Vaci Ut 169

 employs about 500 people and its production consists mainly of transmitter valves of more than 100 Watt anode dissipation, rectifier valves, vacuum capacitors, valves for switch-gear, X-ray and gas discharge tubes (Glimmlampen), etc. A fairly complete list of the monthly production of the plant is attached to this report as Annexure 'A'.

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- (b) The BELOIANNIS Communications Works, BUDAPEST XI, 50X1-HUM
 Fehervari Ut 72 [redacted] employs about 2,000 people
 and produces transmitters of all types (not transmitter
 valves), all types of telecommunications equipment (not
 telephones) radio receivers, etc.
- (c) The TUNGSRAM Works, BUDAPEST IV, Vaci Ut (formerly
 owned and controlled by the mother factory in Sweden)
 employs about 5,000 to 6,000 people. Its production
 consists mainly of transmitter valves of less than 100
 Watt capacity, all types of clystrons, radio receiver
 valves, electric bulbs, strip-lighting and photo electric
 cells. On paper the factory is still Swedish
 property. The Managing Director is a former Hungarian
 subject, now a naturalised Russian.
- (d) The ORION Factory, BUDAPEST X, employs about 1,500 to
 2,000 people and produces mainly radio and television
 receiver sets.
- (e) The REMIX Factory, BUDAPEST X, employs about 800 people.
 Its main products are capacitors, resistors, potentio-
 meters, etc.
- (f) The AUDION Factory, BUDAPEST IV, employs about 150 to
 200 people and produces mainly booster stations.
 (Verstaerkeraemter).
- (g) ELEKTRONICUS MERŐMŰSZEREK GYARA, BUDAPEST XVII, employs
 about 1,500 people. 50X1-HUM
 [redacted]
- (h) HIRADASTECHNIKAI ALAPANYAGYAR, VAC near BUDAPEST,
 employs about 150 people. Its production consists
 mainly of semi-finished products used by the
 electronics industry, such as valve bases, ferrit
 aeriials, iron powder cores for radio coils, etc.
- (i) TELEPHON FABRIK, BUDAPEST XIV, Hungaria Ut, employs
 about 1,500 people and manufactures telephone equip-
 ment, cinema projectors and all types of electrical
 household appliances.
- (j) The Mechanical Laboratory, BUDAPEST VII, Gorkij Fasor,
 employs about 500 to 600 people. No details about
 this laboratory are available, but it is generally
 believed that it deals with research and development
 work on subjects of a military nature, possibly radar.
 An air of secrecy surrounds this laboratory.
- (k) RADIO CABINET FACTORY, BUDAPEST IV, employs about 200
 people and produces only cabinets for radio and
 television receiver sets.
- (l) KARCAGIX UVEGGYAR, KARCAG near BUDAPEST, employs about
 50 people and produces all glass components used by
 the valve factories.

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III. Hungarian Transmitter Valve Factory

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[redacted] the transmitter valves
 3 SO 13 T 4 SO 15 T 3 SO 35 T 4 SO 40 T
 are new types and are at present undergoing rigorous tests before
 mass-production can start.

7. [redacted] the transmitter valves type 50X1-HUM
 4 V 10 T and 4 L 10 T were entirely new types. the development
 stage of which was nearing completion [redacted]
 [redacted]

the test valves were assembled, and news has been received since 50X1-HUM
 that the valves had been tested and had proved entirely satis-
 factory in the initial tests.

8. [redacted] the water-cooled and air-cooled 50X1-HUM
 transmitter valves with a capacity of 80 Kilowatt and 160
 Kilowatt were not tested at the factory, as the necessary test-
 equipment was not available there. As such valves had to be
 tested for 200 hours before delivery to the customer, these tests
 were carried out under special arrangements made with the
 Hungarian Broadcasting Stations. The arrangement was that the
 Broadcasting Stations used every newly produced valve in their
 transmitters for 200 hours under normal broadcasting conditions,
 and, if the valve passed this test successfully, it was returned
 to the Hungarian State-controlled Export Agency ELEKTROIMPEX in
 BUDAPEST with a certificate stating that the valve had been
 tested and passed as being up to the normal standards. As a
 result of these arrangements Broadcasting Stations in Hungary
 could operate their transmitters without having to purchase
 valves, and the entire output of the large expensive transmitter
 valves could be exported. Only the smaller transmitter valves
 were tested on the premises.

9. [redacted] all valves exported by the 50X1-HUM
 Hungarian Transmitter Valve Factory to countries outside the
 East Bloc were marked with the TUNGSRAM mark and were packed in
 TUNGSRAM boxes. The purchaser was therefore not aware of the
 fact that the products with the TUNGSRAM mark were actually
 made in another factory.

10. [redacted] about 75% of the entire 50X1-HUM
 transmitter valve production is exported. About one fifth of
 it goes to the West, [redacted] South-
 America, [redacted] It was
 pointed out that TUNGSRAM maintain a trade office in [redacted]
 [redacted] where all valves
 of Hungarian make can be purchased. The remaining four fifths
 of the exported valves are sold to Yugoslavia, Czechoslovakia,
 Poland, Roumania, and a small proportion to the Soviet Union.
 Between 1953 and 1955 most Hungarian exports went to the Soviet
 Union and China, but at present very little is exported
 to these countries, probably because the Soviet Union can now
 cover its own demands and those of Red China with their own
 products. It was also mentioned that no factory negotiates

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directly with the buyers, as all exports are handled exclusively by the State-controlled Export Agency ELEKTROIMPEX in BUDAPEST. The TUNGSRAM agency in [] which places its orders directly with the factory in BUDAPEST is an exception.

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11. The remaining 25% of the transmitter valve production is for the home consumption, and is mainly absorbed by the Military and Police Authorities.

12. [] the Factory had a fairly high percentage of rejects, due to the defective raw material available. In particular the glass envelopes supplied by KARCAGIX ÜVEGGYAR in KARCAG gave rise to trouble, as the glass had internal tensions which often caused the glass envelope to crack when the leads through the valve-base were sealed in. All these facts were known to the Ministry [] and the factory was officially allowed a wastage of as much as 20% of its output. Although the wastage exceeded this figure at times, the factory managed to keep within the permitted 20% by making false returns.

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13. New development tasks were normally set by the BELOIANNIS Communications Works, when this firm received orders for a new type of transmitter. BELOIANNIS approached the Ministry with a suggested development task for a new type of transmitter valve and, after establishing that the development of a new valve was essential, the Ministry instructed the Hungarian Transmitter Valve Factory to undertake the development task. If the Ministry decided that only a few valves of a particular type were required, it gave permission to buy them, either from satellite countries or, if absolutely essential, from Western countries.

14. In order to measure the efficiency of their own types of valves the Hungarian Transmitter Valve Factory occasionally obtained valves from Western Countries by devious ways via []. The Western valves were then taken to pieces and analysed, in order to improve the Factory's own production, particularly of those types which were sold in the West.

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15. [] an organisational chart of the factory, which is attached as Annexure 'E'. Names of staff were not entered as many changes have probably taken place in the various departments []

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[] at least 10% of the entire personnel, including the higher grades, had defected and are now scattered all over the world []

16. It may be of interest to note that after 1950 the Hungarian valve industry had expanded to about ten times its previous volume. []

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[] stopped the export of valves and other electronic gear [] to countries behind the Iron Curtain on account of the embargo restrictions. As the requirements in Hungary and other satellites were increasing, the local industry was forced to start its own large-scale production, and Hungary is now capable of supplying the entire demand at home, as well as export much of its production. Most of the valves produced are based on Western products, although in recent years some original types were developed.

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Annexure 'A'

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Monthly production plan (in Forint)

<u>Type</u>	<u>Quantity</u>	<u>Price per valve</u>	<u>Total Value</u>	
<u>Transmitter valves</u>				
3 V 160 Z	5	72,000.- Frt	360,000.- Frt	
3 V 80 Z	12	38,000.- Frt	456,000.- Frt	
4 V 15 Z	4	16,000.- Frt	64,000.- Frt	
3 V 20 Z 2	10	12,000.- Frt	120,000.- Frt	
5 L 12 Z	2	15,000.- Frt	30,000.- Frt	
3 V 5 T	8	8,000.- Frt	64,000.- Frt	
3 V 25 T	3	42,000.- Frt	126,000.- Frt	
5 SO 45 T	200	2,500.- Frt	500,000.- Frt	
3 L 1 T	10	4,500.- Frt	45,000.- Frt	
			<u>1765,000.- Frt</u>	1,765,000.- Frt
<u>Vacuum Capacitors</u>				
12 pF	20	1,000.- Frt	20,000.- Frt	
25 pF	30	1,300.- Frt	39,000.- Frt	
50 pF	30	1,600.- Frt	48,000.- Frt	
100 pF	20	1,800.- Frt	36,000.- Frt	
			<u>143,000.- Frt</u>	143,000.- Frt
<u>Rectifier Valves</u>				
4 QO 25	200	600.- Frt	120,000.- Frt	
5 QO 105	100	1,000.- Frt	100,000.- Frt	
6 QR 1	15	1,500.- Frt	22,500.- Frt	
9 Q 205	40	2,000.- Frt	80,000.- Frt	
Rg 250/3000	200	600.- Frt	120,000.- Frt	
Rg 1000/3000	200	800.- Frt	160,000.- Frt	
8 QR 5	12	12,000.- Frt	144,000.- Frt	
			<u>746,500.- Frt</u>	746,500.- Frt
<u>Gas discharge tubes, and valves for switch gear</u>				
No details of types and quantity		500,000.- Frt		500,000.- Frt
				<u>3,154,500.- Frt</u>

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Annexure 'B'

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Transmitter Valve Ratings

Type	V_f (V)	I_f (A)	I_e (A)	D(%) ("Durchgriff")	S (mA/V)	Q_a (kW)	f_{max} (c/E)	Material of cathode	Cooling system	Equivalent valve type in the West
3 V 8 Z	22.0	78.0	8.0	4.5	7	7.5	75	W	water	TA 12/10 Philips
3 L 8 Z	22.0	78.0	8.0	4.5	7	7.5	75	W	air	TA 12/10 Philips
3 V 20 Z-1	21.5	78.0	11.0	2.6	10	18.0	30	W	water	TA 12/20 Philips
3 L 20 Z-1	21.5	78.0	11.0	2.6	10	18.0	30	W	air	TA 12/20 Philips
5 V 12 Z	22.0	80.0	12.0	?	?	15.0	30	W	water	PA 12/15 Philips
5 L 12 Z	22.0	80.0	12.0	?	?	15.0	30	W	air	PA 12/15 Philips
3 V 20 Z-2	21.5	62.0	8.0	?	?	20.0	20	W	water	3 Q 200 A Standard
3 L 20 Z-2	21.5	62.0	8.0	?	?	20.0	20	W	air	3 Q 200 A Standard
4 V 15 Z	21.5	72.0	10.0	?	?	20.0	20	W	water	4 Q ? ? Standard
4 L 15 Z	21.5	72.0	10.0	?	?	20.0	20	W	air	4 Q ? ? Standard
3 V 80 Z	27.0	230.0	45.0	?	?	80.0	20	W	water	4 Q 300 Standard
3 V 160 Z	31.0	600.0	100.0	?	?	160.0	20	W	water	3 Q 331 Standard
3 SO 13 T	5.0	6.5	1.5	4.0	4.5	0.135	200	thoriated tungsten	radiated	T 130-1 Brown Boveri
4 SO 15 T	5.0	6.5	1.2	18.0	4.0	0.160	220	W	"	Q 160-1 Brown Boveri
3 SO 35 T	5.0	15.0	2.5	3.3	9.0	0.350	150	W	"	T 350-1 Brown Boveri
4 SO 40 T	5.0	15.0	2.2	20.0	4.5	0.400	120	W	"	Q 400-1 Brown Boveri
3 L I T	5.0	50.0	10.0	3.0	12.0	2.0	200	W	air	entirely new development in Hungary
3 V 5 T	12.6	28.0	12.0	3.5	12.0	5.0	60	W	water	-do-
3 L 5 T	12.6	28.0	12.0	3.5	12.0	5.0	60	W	air	-do-
3 V 6 T	5.0	140.0	25.0	3.0	28.0	10.0	120	W	water	-do-
3 L 6 T	5.0	140.0	25.0	3.0	28.0	10.0	120	W	air	-do-
3 V 25 T	10.0	310.0	100.0	2.2	55.0	50.0	60	W	water	-do-
3 L 25 T	10.0	310.0	100.0	2.2	55.0	50.0	60	W	air	-do-
3 S 101 T	12.0	17.0	5.6	3.0	18.0	1.1	30	W	radiated	TB 3/2000 Philips
5 SO 45 T	12.0	8.5	4.5	30.0	6.5	0.45	30	W	"	PB 3/800 Philips
4 V 10 T	7.5	?	30.0	?	?	10.0	100	W	water	} at the beginning of the rising in Hungary still in the development stage
4 L 10 T	7.5	?	30.0	?	?	10.0	100	W	air	

Annexure 'C'

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Rectifier Ratings.

Type	V_f (V)	I_f (A)	I_o max (A)	I_{ap} max (A)	V_{iuv} (kV)	Equivalent rectifier type in the West
4 QO 25	2.5	4.8	0.25	1.0	10.0	DOG 4/1000 Philips
5 QO 105	5.0	7.0	1.5	6.0	13.0	DOG 5/5000 Philips
6 QR 1	5.0	6.5	1.0	4.0	13.0 with grid	DOG 6/6000 Philips
9 Q 205	5.0	12.5	2.5	10.0	21.0	DOG 9/20 Philips
12 QR 205	5.0	13.5	2.5	10.0	27.0 with grid	DOG 12/30 Philips
RG 250/3000	2.5	4.8	0.25	1.0	10.0	RG 250/3000 Tungstam
RG 1000/3000	5.0	6.5	1.25	5.0	10.0	RG 1000/3000 Tungstam
8 Q 5	5.0	42.0	7.5	30.0	20.0	4079A Standard
8 QR 5	5.0	42.0	7.5	30.0	20.0 with grid	4079A Standard
8 QR 15	5.0	70.0	15.0	60.0	20.0 with grid	
250 XR 8	2.5	22.0	8.0	25.0	0.35 with grid	

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Annexure 'D'

Vacuum Capacitor Ratings

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Type	Capacitance	V _(peak) (kV)	I _{H.F.} (A)	f _{max} (c/s)
15 VK 24 - 12 pF	12 ± 10%	15	24	60
15 VK 24 - 25 pF	25 ± 10%	15	24	60
15 VK 24 - 50 pF	50 ± 10%	15	24	60
15 VK 24 - 100 pF	100 ± 10%	15	24	60
30 VK 24 - 12 pF	12 ± 5%	30	24	60
30 VK 24 - 25 pF	25 ± 5%	30	24	60
30 VK 24 - 50 pF	50 ± 5%	30	24	60
30 VK 24 - 100 pF	100 ± 5%	30	24	60

ANNEXURE 'E'

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